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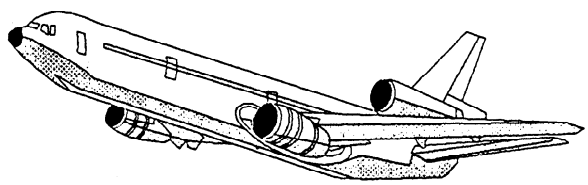
Federal Aviation Administration

Advisory Circular

AC 120-53
Date: 5/13/91

Crew Qualification and Pilot Type Rating Requirements for Transport Category Aircraft



Operated under FAR Part 121

U.S. Department of Transportation
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Advisory Circular

Subject: CREW QUALIFICATION AND PILOT TYPE RATING REQUIREMENTS FOR TRANSPORT CATEGORY AIRCRAFT OPERATED UNDER FAR PART 121

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Initiated by: AFS-200

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1. PURPOSE. This advisory circular (AC) provides an acceptable means, but not the only means, of compliance with Federal Aviation Regulations (FAR) regarding qualification and type rating of flight crewmembers operating under Part 121 of the FAR. Included are criteria for determination and approval of training, checking, and currency necessary for safe operation of aircraft in air carrier operations, particularly for pilots who frequently fly different variants of the same type aircraft. This AC also describes the process by which the Federal Aviation Administration (FAA) determines "type rating" requirements applicable to the pilot in command of new or modified aircraft. Details of the systems, processes, and tests necessary to apply this AC are explained in the Appendix. While the criteria of this AC are not mandatory, they describe acceptable means of compliance based on extensive FAA and industry experience with pertinent FAR. Mandatory terms used in this AC such as "shall" or "must" are used only in the sense of ensuring applicability of these particular methods of compliance when the acceptable means of compliance described herein are used. The provisions of this AC do not add or change regulatory requirements, authorize deviations from regulatory requirements, or interpret regulatory requirements. Interpretations of regulatory requirements are issued pursuant to established agency procedures.

2. FOCUS. This AC applies to air carriers operating under FAR Part 121 and the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR). It particularly addresses operators whose flightcrews operate several variants of an aircraft type in a mixed fleet. In addition, it applies to aircraft manufacturers or modifiers who design, test, and certificate transport aircraft or variants of those aircraft, as well as to training centers having programs approved for use under FAR Part 121. The AC may be used by operators seeking credit for prior flightcrew experience with one variant when transitioning to other variants.

3. RELATED READING MATERIAL.

a. FAR Parts 1, 61, 61 Appendix A, FAR 121 Subparts N and O, Appendix E and Appendix F, and Advanced Qualification Program (AQP) SFAR 58.

b. Current editions of the following AC's: AC 61-89, Pilot Certificates: Aircraft Type Ratings; AC 120-35, Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation; AC 120-40, Airplane Simulator and Visual System Evaluation; AC 120-45, Advanced Training Devices (Airplane Only) Evaluation and Qualification; AC 120-46, Use of Advanced Training Devices (Airplane Only);

AC 120-51, Cockpit Resource Management Training; and FAA-S-8081-5, Airline Transport Pilot and Type Rating Practical Test Standards (this Practical Test Standard can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402).

4. DEFINITIONS. Certain definitions are necessary to uniformly apply this AC's concepts. Unless otherwise noted, definitions apply only to this AC. Key definitions are provided below. Other related definitions, such as for "common type rating," are included in the Appendix.

a. Base Aircraft. An operator designated aircraft or group of aircraft used as a reference to compare differences with other aircraft within an operator's fleet.

b. Variant. A variant is an aircraft or a group of aircraft with the same characteristics that have pertinent differences from a base aircraft. Pertinent differences are those which require different or additional flightcrew knowledge, skills, and/or abilities that affect flight safety.

c. Mixed Fleet Flying. Mixed fleet flying is operation of a base aircraft and one or more variants of the same type, common type, or a different type by one or more flight crewmembers, between training or checking events. This may occur when crewmembers routinely fly variants within a given bid line, between alternating bid lines from month-to-month, or when a variant or different type aircraft is flown occasionally between proficiency training or checks.

5. INTRODUCTION.

a. A System for Crew Qualification. The FAA specifies criteria for air carrier crew qualification (training, checking, and currency) for particular aircraft types through FAA Flight Standardization Board (FSB) evaluations and findings. FSB findings are described in reports for specific aircraft types which define criteria to show compliance with applicable FAR. Reports are directives to FAA Flight Standards District Offices for use by FAA principal inspectors and other inspectors. FSB report provisions serve as a basis for FAA's approval of operators' programs and for airmen certification to ensure compliance with the FAR.

b. Changes Needed. In the past, FSB evaluations were done on a one-time basis. Operators were not directly involved except through application and approval of initial programs. Necessary support for the FSB process is provided by the industry, but procedures often vary by manufacturer, individual project, and operator. Because evaluations were done on a case-by-case basis, results could not be accurately predicted until near the time of type certification. Decisions regarding aircraft design, acquisition, crew training, training devices, and simulators were difficult because of uncertainty about FAA requirements. The need to update, revise, and enhance the system for setting and applying requirements for crew qualification is also affected by other factors including:

(1) Introduction of many more derivative aircraft types.

(2) Increasing significance of modifications to existing aircraft, particularly with regard to engines or avionics.

(3) Integration of diverse fleets of aircraft following airline acquisition or mergers.

(4) Increased dependence on leased aircraft, many of which are configured differently than an operator's basic fleet.

(5) A wider variety of equipment options available in purchase of new aircraft or retrofit.

(6) Introduction of new technology cockpit enhancements.

c. Revisions Introduced by this AC. This AC describes necessary revisions and enhancements to the crew qualification process to address uniform, systematic, timely, and comprehensive application of pertinent FAR in a changing and increasingly complex air carrier operating environment. The revised system defines key terms and concepts, establishes tests and processes, and specifies responsibilities of FAA personnel, manufacturers, and operators who apply the system. The AC provides a common method for the industry and FAA to describe, evaluate, and approve particular programs. FAA policies for airmen certification, training, checking, and currency are clarified. This includes defining the role and criteria for designation of type ratings for existing, new, derivative, or modified aircraft. Key provisions of the AC include the following:

(1) Standard methods and objective tests are defined to formulate crew qualification criteria.

(2) Comments from operators, manufacturers, and the public are considered in formulating requirements.

(3) Master requirements are identified for qualification of crews, particularly for those crews who fly or transition between different variants.

(4) A standardized process is defined to address operator unique fleet differences and compliance methods.

(5) Provision is made to periodically update FSB criteria when necessary.

6. CONCEPTS. Additional concepts are introduced to uniformly apply the FAR related to crew qualification and differences. Crew qualification requirements for training, checking, and currency are expressed as FAA master requirements and are described in FSB reports for each type, common type, or related type aircraft. Master requirements are expressed either in the form

of master common requirements (MCR's) or master difference requirements (MDR's) as described in subparagraphs a and b. MDR's are stated in terms of minimum acceptable difference levels. Operators show compliance with the FAA MDR's through an operator's specific document which lists each particular operator's fleet differences and compliance methods. Operator difference requirements (ODR's) specify requirements uniquely applicable to a particular fleet and mixed flying situation and are based on the MDR's. The AC's main concepts are summarized in subparagraphs a through d. These and other concepts are more fully described in the appropriate AC attachments to the appendix.

a. Master Common Requirements (MCR's). Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. MCR's are specified by the FSB when an aircraft is originally type certificated and are revised as necessary when variants are developed. When variants exist, MCR's specify only those items which are common to all variants.

b. Master Difference Requirements (MDR's). Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. MDR's are specified by the FSB in terms of difference levels. MDR's apply between particular pairs of variants or variant groups and are shown on an MDR table.

c. Difference Levels. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to FAR Part 121. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each specified for training, checking, and currency.

d. Operator Difference Requirements (ODR's). Operator difference requirements are those operator specific requirements necessary to address differences between a base aircraft and one or more variants, when operating in mixed fleet flying, or when seeking credit in transition programs. ODR's include both a description of differences and a corresponding list of training, checking, and currency compliance methods which address pertinent FSB and FAR Part 121 requirements.

7. SETTING FAA REQUIREMENTS. FSB requirements are set by a process of proposal development, testing, draft requirement formulation, public comment, FSB final determinations, and FAA approval.

a. Manufacturer's Proposals. Aircraft manufacturers or modifiers usually initiate proposals for formulation or amendment of FSB requirements. This is done in conjunction with application for type certification or supplemental

type certification of an aircraft or variant. The FAA, operators, and, in certain instances, other organizations or individuals may also initiate proposals or amendments.

b. Standardized Tests. A main element of the requirements formulation process is use of standardized testing to determine crew qualification requirements (MCR's and MDR's). One or more of five tests are applied, depending on the proposal to FAA, degree of differences between variants, difference levels sought, and the outcome of any previous tests. Only those tests which are needed are used. Testing leads to assignment of MCR's and MDR's, development of example programs acceptable to FAA, and identification of other necessary supporting information. In certain instances, tests may be waived or difference levels may be assigned based on operational experience.

c. FAA Formulation and Implementation of Requirements. Following testing and formulation of draft requirements, public comment is sought. FSB requirements determinations are then made specifying master common requirements, master difference requirements, and any necessary supporting information. Supporting information may pertain to operator certification, airmen certification, approval of devices and simulators, FAR compliance status of variants, and other items necessary for proper application of master requirements. An FSB report is prepared, and review and approval is completed. The FSB report is distributed to FAA field offices. FSB reports are considered FAA policy for review, approval, certification, and evaluation of operator programs.

d. Revision of Requirements. FSB reports are periodically updated when new variants are introduced, when requested by operators or manufacturers based on operating experience, or when the FAA otherwise determines it to be necessary for safety reasons.

e. Type Ratings. Same, common, or additional type ratings are assigned, based on difference level determinations. For example, an additional type rating is assigned to a variant group when it is determined that level E training is required for one or more variant pairs.

8. OPERATOR COMPLIANCE WITH FAA REQUIREMENTS.

a. Obtaining FSB Information. Operators are advised of pertinent FSB information through FAA certificate holding district offices and FAA principal operations inspectors (POI's). Operators may also obtain FSB information from aircraft manufacturers or modifiers, other operators, or other aviation organizations who maintain awareness of FAA policies.

b. Operator Proposals. As specified by the FAR, operators apply to FAA for approval of training programs, training devices, check airmen, and operations specifications. In addition, operators request FAA to conduct airman certification or request approval of designated examiners. Proposals for each of these items or activities must be consistent with FSB requirements, or alternate approval must be sought. This is to ensure pertinent FAR compliance for specific aircraft types and variants.

c. Operator Compliance Without Mixed Fleet Flying. When variants are not flown or are not used in mixed fleet flying, FAA applies MCR's and other related FSB provisions, and operators comply with those provisions.

d. Operator Compliance With Mixed Fleet Flying. When variants are flown in mixed fleets, FAA also applies, and operators comply with, MDR's and other related FSB differences provisions. Operators accomplish this by identifying a "base" aircraft, describing differences which exist between their base aircraft and variants, and by specifying particular means of compliance to satisfy MDR's. The description of specific differences and compliance methods are identified as that air carrier's ODR's. ODR's constitute the approval basis for an operator's mixed fleet flying program and specify any necessary constraints or permissible credits. Constraints or credits may relate to knowledge, skills, devices, simulators, maneuvers, checks, currency, or any other such factors necessary for safe operations. Constraints or credits may be applied generally, or only to specific variants or crew positions. Once approved, operators' programs are conducted in accordance with these ODR's. ODR proposals are provided to the FAA in a standard tabular format and are approved by FAA principal inspectors only if they meet MDR and other pertinent FSB requirements. ODR's are amended by the operator as base aircraft, variants, training devices, or as other pertinent factors change. Each amendment is approved by the FAA.

e. Transition Credit. In addition to mixed fleet flying, ODR's may be used to permit credit between variants in transition programs, consistent with FSB provisions.

9. FAA APPROVAL OF OPERATOR PROGRAMS.

a. POI Approval. FAA POI's approve operator programs when those programs comply with FSB provisions. If programs less restrictive are proposed, POI's advise the applicant that the program must be revised to comply, a request for change of the MCR's or MDR's must be initiated, the difference between variants must be reduced or eliminated, or an alternate approval must be sought. Programs more restrictive than FAA requirements may be approved at the operator and POI's discretion.

b. Limitations of POI Authority. When applicable, POI's may approve programs within provisions of the FSB report and this AC. AC provisions apply because certain other general constraints are identified such as a limitation on the number of different variants which may be used in mixed fleet flying. POI's may not approve programs outside the bounds of FSB or AC provisions without authorization of the FAA Air Transportation Division, AFS-200. Variation from FSB or AC provisions is approved by AFS-200 only when an equivalent level of safety can be demonstrated.

10. APPLICATION OF FSB REQUIREMENTS TO AIRMEN CERTIFICATION.

a. Evaluation Items or Maneuvers. FSB requirements for airmen certification are specified and knowledge, skills, abilities, maneuvers,

performance criteria, or other relevant items for type ratings, proficiency checks, other checks or testing are identified when necessary. This is appropriate to address any type or variant specific factors related to FAR Part 61, FAR Part 121, or SFAR compliance.

b. Evaluator Qualification. FSB requirements identify any type or variant specific criteria pertinent to FAA inspectors, aircrew program managers, aircrew program designees, check airmen, instructors, or other evaluators.

11. TRAINING DEVICE AND SIMULATOR APPROVALS.

a. Standard Devices or Simulators. Standardized training methods, devices, or simulators are associated with each of the difference levels. Devices or simulators are approved for particular operators by POI's consistent with FAA National Simulator Evaluation Team (NSET) determinations and FSB master requirements.

b. Special Criteria. In some instances, standard device or simulator criteria may not be appropriate for new technology, particular variant combinations, or other situations. The FSB may specify additional criteria in FSB reports in these instances.

12. REVIEW, APPROVAL, AND APPEAL OF FAA DECISIONS. A process for review of FSB evaluations, approval of FSB reports, and appeal of FSB findings is specified. The FAA Director, Flight Standards Service, AFS-1, assigns responsibility to resolve appeals.

13. OTHER MEANS OF COMPLIANCE. In the event operators or manufacturers elect not to apply criteria of this AC and FSB findings, provision is made for approval of an alternate means of compliance. Demonstration of an equivalent level of safety to that provided by this AC rests with the applicant in attempting to seek such alternate approval.

14. SAFETY AND OTHER BENEFITS INTENDED. Provisions of this AC are intended to enhance safety by:

a. Standardizing FAA's application of pertinent FAR related to crew qualification and differences.

b. Providing a common method of assessment of operators' and manufacturers' programs.

c. Directly relating crew qualification and training requirements to fleet characteristics, operating concepts, and crew assignments.

d. Permitting better planning and management of fleets, crew assignments, and training resources by knowing in advance what FAA requirements apply, what training resources or devices are needed, and what alternatives are possible.

e. Permitting timely and consistent decisions about fleet acquisition, integration, modification, or phaseout related to crew qualification or crew assignments.

f. Permitting manufacturers to design aircraft which take advantage of new technology or are common with existing variants, as appropriate to a particular operator's fleet.

g. Encouraging cockpit standardization by crediting commonality and identifying necessary constraints when differences exist.

h. Providing a framework for application of suitable credits or constraints to better address new technology and future safety enhancements.

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